



**Idaho State Department of Agriculture
Division of Agricultural Resources**

**Water Quality Monitoring Report
Lower Payette River
Buckingham Sub-watershed
S-series Drains**



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ISDA Technical Result Summary No. W-7

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Introduction

This technical report presents water quality data collected by the Idaho State Department of Agriculture (ISDA) on the Lower Payette River S-drains from April 2000 through March 2002. ISDA was requested by the Payette Soil and Water Conservation District (SWCD) to undertake this monitoring program to quantify the pollutant loading that these drains deliver to the Lower Payette River. This area has had historical water quality monitoring conducted for the State Agricultural Water Quality Program (SAWQP) by both the Idaho Department of Environmental Quality (IDEQ) and ISDA.

This study area, designated as the Buckingham Subwatershed (Figure 1), is currently the focus for implementation of Best Management Practice (BMP) projects funded by the Environmental Quality Incentives Program (EQIP) and the state Water Quality Program for Agricul-

ture (WQPA). This two-year study was designed to collect background water quality data prior to BMP implementation.

Monitoring was made possible by state funding that allows ISDA to support the Soil Conservation Commission (SCC), Idaho Soil Conservation Districts (SCDs) and local farmers and ranchers with the implementation phase of the Total Maximum Daily Load (TMDL) process. Monitoring will help assist in understanding the source and transport of contaminates from various agricultural practices.

Background

These series of drains have been earmarked by the Payette SWCD, as major contributors of sediment, phosphorus and bacteria into the Lower Payette River as a result of prior monitoring efforts.

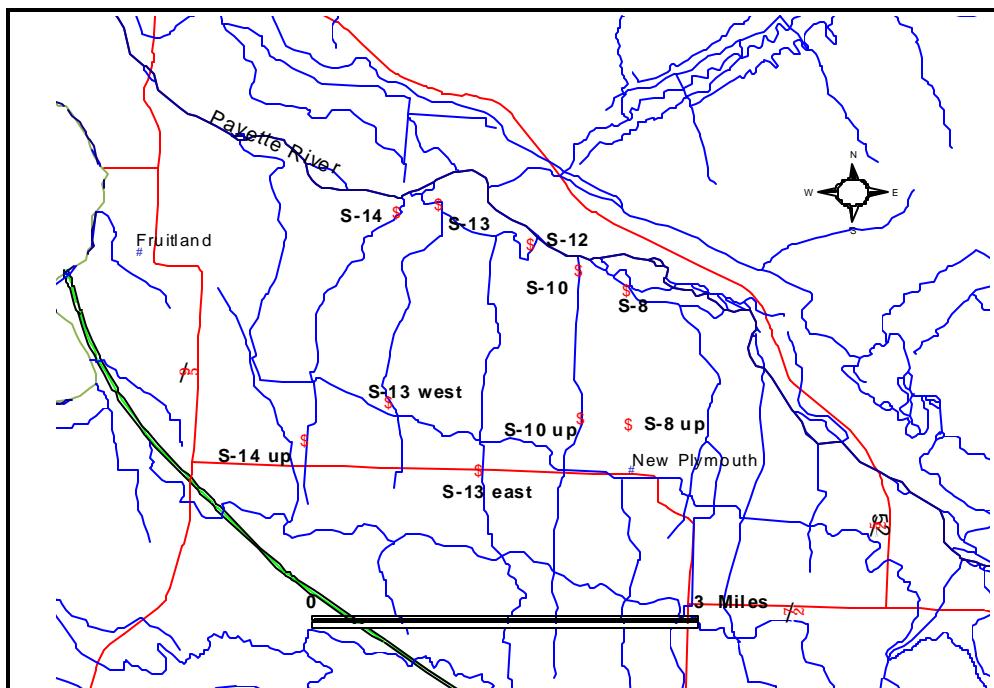


Figure 1. Lower Payette River S-series drains sampling locations

The drains in this study were designated as follows; S-14, S-14 up, S-13, S-13 up, S-12, S-10, S-10 up, S-8, and S-8 up (Figure 1). With the exception of drain S-12 all of the drains had an upstream site and a downstream site. The upstream sites were established to determine the loads derived from the upper part of the sub-watershed which consists of pasture land with some irrigated croplands. The lower sites were placed close to the Payette River to account for the total load generated from each sub-watershed. These lower sites also allow determination of loads from the lower part of the sub-watershed which is primarily furrow irrigated row crop acreage. Drain S-13 required two upstream sites (S13 E. and S13 W.) to characterize the upper sub-watershed. Drain S-12 did not have an upper station since it only services the lower portion of the sub-watershed (Figure 1).

All of the drains were monitored over a two year period with samples collected twice a month from April through October and monthly during November through March. Water quality parameters evaluated were total suspended solids (TSS), total volatile solids (TVS), total phosphorus (TP), ortho-phosphorus (OP), nitrate + nitrite (NO₃ + NO₂), fecal coliform, and *Escherichia Coli* (*E-coli*). On-site measurements consisted of discharge (CFS), dissolved oxygen (DO), percent saturation (%sat), total dissolved solids (TDS), conductivity, temperature, and pH. Appendix B contains all of the analytical and on-site measurement results over the two year study period.

Total Maximum Daily Load (TMDL)

The Lower Payette River TMDL was approved on May 31, 2000 for one segment (Black Canyon Dam to the Snake River) for fecal coliform bacteria. Drains monitored in this study contribute fecal bacteria, sediment, and phosphorus into the Lower Payette River. When the Snake River Hells Canyon (SR-HC) TMDL is finalized and approved the Lower Payette will probably face additional reductions for phosphorus and sediment.

Results

Total Suspended Solids

On average, the five S-drains combined delivered 44,193 lbs/day and 50,431 lbs/day of TSS for year one and year two respectively. Year one average total TSS loading for each drain were: S-13, 14,413 lbs/day; S-10, 9,589 lbs/day; S-8 8,409 lbs/day; S-14, 6,383 lbs/day; and S-12, 6,119 lbs/day. The second year total average TSS loadings were: S-13, 15,879 lbs/day; S-14, 11,764 lbs/day; S-12, 8,619 lbs/day; S-8, 7,211 lbs/day; and S-10, 6,976 lbs/day (Figure 2).

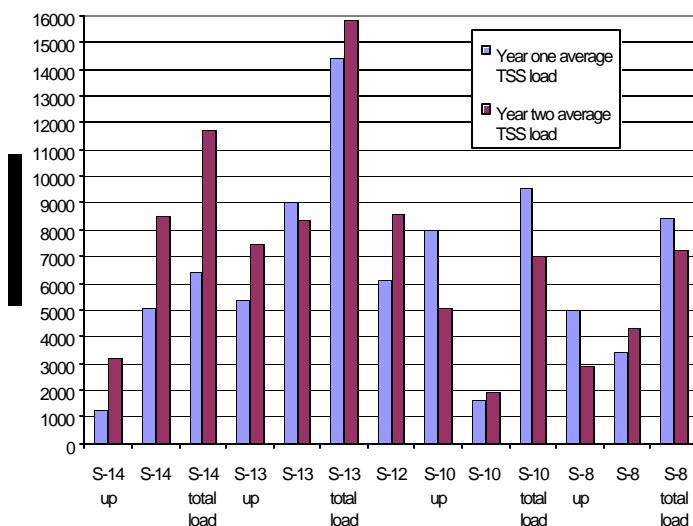


Figure 2. TSS loads for 2000-2001 and 2001-2002

Table 1 and 2 give a breakdown of TSS loads both in pounds, tons and tons lost per acre and a percentage of the load that comes from the upper and lower drainages.

Table 1. Year One (2000-2001) TSS loads

Site	Avg. lbs/day	Avg. lbs/yr.	Tons/year	Acreage	Tons lost/acre	% TSS load
S-14 up	1280	467,200	234	675	0.35	20
S-14	5102	1,862,230	931	905	1.03	80
S-13 up	5349	1,952,385	976	1017	0.96	37
S-13	9064	3,308,360	1654	2406	0.69	63
S-12	6119	2,233,435	1117	520	2.15	100
S-10 up	7999	2,919,635	1460	835	1.75	83
S-10	1599	583,635	292	579	0.50	17
S-8 up	4992	1,822,080	911	1360	0.67	59
S-8	3417	1,247,205	624	453	1.38	41

Table 2. Year 2 (2001-2002) TSS loads

Site	Avg. lbs/day	Avg. lbs/yr.	Tons/year	Acreage	Tons lost/acre	% TSS load
S-14 up	3235	1,180,775	590	675	0.87	27
S-14	8511	3,106,515	1553	905	1.72	73
S-13 up	7490	2,733,850	1367	1017	1.34	47
S-13	8389	3,061,985	1531	2406	0.64	53
S-12	8619	3,145,935	1573	520	3.02	100
S-10 up	5046	1,841,790	921	835	1.10	72
S-10	1930	704,450	352	579	0.61	28
S-8 up	2893	1,055,945	528	1360	0.39	40
S-8	4318	1,576,070	788	453	1.74	60

Total Phosphorus

The S-drains contributed an average of 104 lbs/day of total phosphorus during the 2000-20001 season and 109 lbs/day during the 2001-2002 season. On average approximately 50% of the phosphorus load, for both years, was non-particulate or dissolved phosphorus.

The phosphorus loads for year one were: S-13, 39 lbs/day; S-10, 22 lbs/day; S-14, 19 lbs/day; S-8, 15 lbs/day; and S-12, 9 lbs/day. Year two loads were: S-13, 38 lbs/day; S-14, 25 lbs/day; S-10, 17 lbs/day; S-8, 15 lbs/day; and S-12, 14 lbs/day (Figure 3).

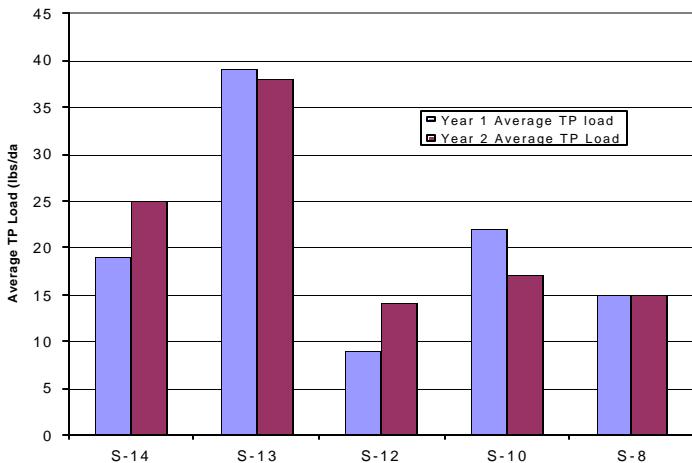


Figure 3. Average TP loads year one and year two

The proposed Snake River Hells Canyon (SR-HC) TMDL would require a TP reduction of 50% for the Payette River. The target concentration for TP for the SR-HC TMDL from river mile 409 to Oxbow Dam is 0.07 mg/L. The load reductions that would be required for the Lower Payette S-series drains (from both the upper and lower

Table 3. Year one (2000-2001) TP load reductions to meet SR-HC TMDL

Site I.D. Year 1	Proposed SR-HC Load (lbs/day)	Actual Measured Load (lbs/day)	% Reduction to meet SR-HC TMDL
S-14 up	3.0	7.0	58
S-14	5.0	12.0	58
S-13 up	4.0	16.0	75
S-13	5.0	23.0	78
S-12	2.0	9.0	78
S-10 up	5.0	18.0	73
S-10	5.0	4.0	0
S-8 up	4.0	12.0	67
S-8	4.0	3.0	0

sub-watersheds) to meet the 0.07 mg/L target are presented in Tables 3 and 4.

Table 4. Year two (2001-2002) TP load reductions to meet SR-HC TMDL

Site I.D. Year 2	Proposed SR-HC Load (lbs/day)	Actual Measured Load (lbs/day)	% Reduction to meet SR-HC TMDL
S-14 up	4.0	10.0	60
S-14	4.0	15.0	74
S-13 up	3.0	18.0	78
S-13	5.0	20.0	75
S-12	2.0	14.0	86
S-10 up	5.0	17.0 *	71
S-10	4.0	0 *	0
S-8 up	4.0	10.0	60
S-8	4.0	5.0	20

* The load at S-10 up was identical to the load at S-10

At the downstream stations there appears to be a good regression between TP and TSS (Appendix A). The strongest regressions were at stations S-12 ($r^2 = 0.873$), S-8 ($r^2 = 0.837$) and S-14 ($r^2 = 0.785$). Weaker correlations were observed at station S-13 ($r^2 = 0.699$) and S-10 ($r^2 = 0.473$). Sediment driven BMPs will have a direct impact on particulate TP loads within the Lower Payette River.

Bacteria

As previously mentioned the Lower Payette River has an approved TMDL which requires reductions in fecal coliform bacteria within the river. Since the completion of the Lower Payette River TMDL the state standard for bacteria has changed from fecal coliform to Escherichia Coli (*E.coli*). ISDA collected samples for both fecal coliform and *E.coli* bacteria during this study (Appendix B). For this report only the *E.coli* data are discussed due to the change in the state water quality regulations.

The state standard for *E. Coli* bacteria (IDAPA 58.01.02 sect. 251) is 406 CFUs (colony forming units) detected at any one time. The concentration of 406 is a trigger that would require additional sampling at a rate of 5 samples over a 30 day period to calculate the geometric mean. A geometric mean concentration of 126 CFUs or greater would indicate a violation of water quality standards. ISDA did not collect any geometric mean data during this study. All of the bacteria data are based on one time discrete water samples.

All of the drains, at one time or another, exceeded the *E. Coli* standard of 406 CFUs for a one time sample. Refer to Table 5 for percent exceedance at each location.

Table 5. Percent exceedance of one time *E.coli* standard

Site I.D.	Year 1 (2000-2001)	Year 2 (2001-2002)
S-14	35%	47%
S-14 up	35%	45%
S-13	50%	60%
S-13 E.	76%	60%
S-13 W.	40%	30%
S-12	50%	60%
S-10	33%	58%
S-10 up	45%	53%
S-8	37%	42%
S-8 up	50%	40%

It has been stated within the lower Payette TMDL document that sampling results from the lower Payette area indicate a general relationship between fecal coliform and TSS. It is also stated in both the Payette TMDL and the implementation plan that BMPs used to control sediment and nutrients will also help reduce bacteria.

The data collected from the Buckingham sub-watershed indicates that there are no correlations between TSS values and *E-coli*. Regressions indicate a poor relationship with R² values ranging from 0.010 to 0.108 (Appendix A). BMPs used to control sediment and nutrients may not be sufficient to control *E.-coli* bacteria levels.

Conclusions

The proposed TSS levels in the Snake River Hells Canyon TMDL call for a monthly average of no greater than 50 mg/L for protection of fish. Using this figure (50 mg/L) and the calculated 2 year averages from the TSS data collected by ISDA, a reduction of 49% would be required to meet SR-HC TMDL levels. This reduction would apply to both the upper drainage sites along with the lower sites near the Payette River. This 49% is somewhat lower than the 60% proposed within the SR-HC TMDL for drains discharging into the Snake River.

The proposed TP concentration for the SR-HC TMDL is 0.07 mg/L. Using this proposed concentration would require a 30% reduction in TP at the confluence of the Payette River with the Snake River. Averaging the 2 years of data, collected on the S-drains, indicates a 63% reduction, would be required on these drains to meet the proposed TMDL concentration of 0.07 mg/L. This reduction ap-

plies to both the upper drainage sites and the lower sites.

Bacteria levels vary throughout the Buckingham Sub-watershed but it appears that the bulk of the exceedances for *E-coli* (\geq 406 CFUs) occur during the irrigation season (April through October). The 2 years of data indicate S-13 E. had the highest average percentage of exceedances at 68% followed by S-13 and S-12 at 55%. The remaining sites had an average exceedance rate ranging from 49% to 35%.

Recommendations

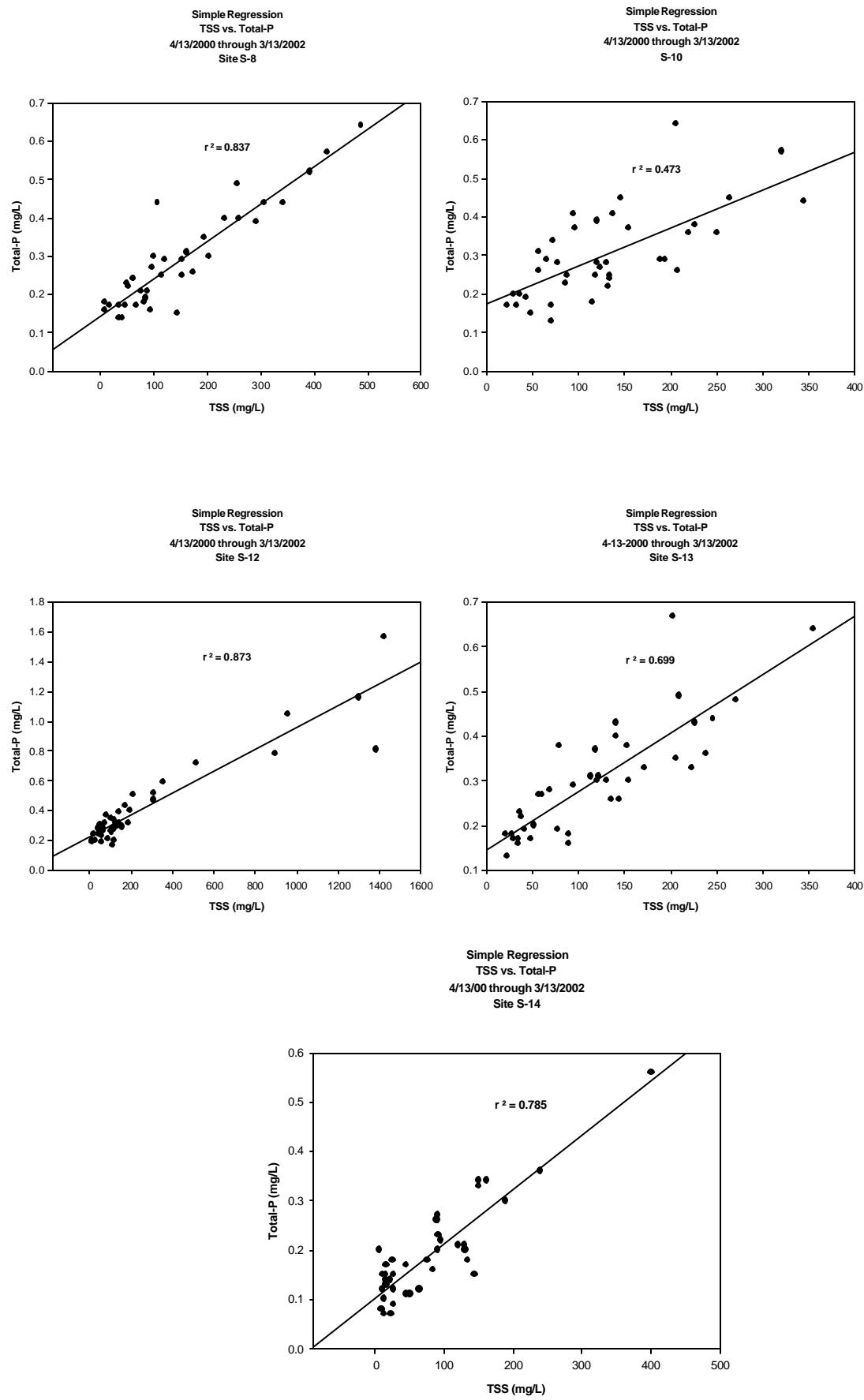
- The Payette Soil and Water Conservation District (SWCD) along with the Soil Conservation Commission (SCC), Natural Resource Conservation Service (NRCS) and ISDA staff should work with local landowners to identify problems within the Buckingham sub-watershed.
- The SWCD, SCC, NRCS and ISDA continue to work with landowners and cooperators to fund and implement projects that will improve the water quality within the sub-watershed.
- Evaluation of irrigation practices and irrigation water return systems to determine which ones are causing the majority of impacts within these drainage systems.
- Identification of critical areas or critical activities best addressed by implementation of BMPs.
- ISDA will continue to work with all interested parties to evaluate water quality and BMP effectiveness within the Lower Payette River system.

References

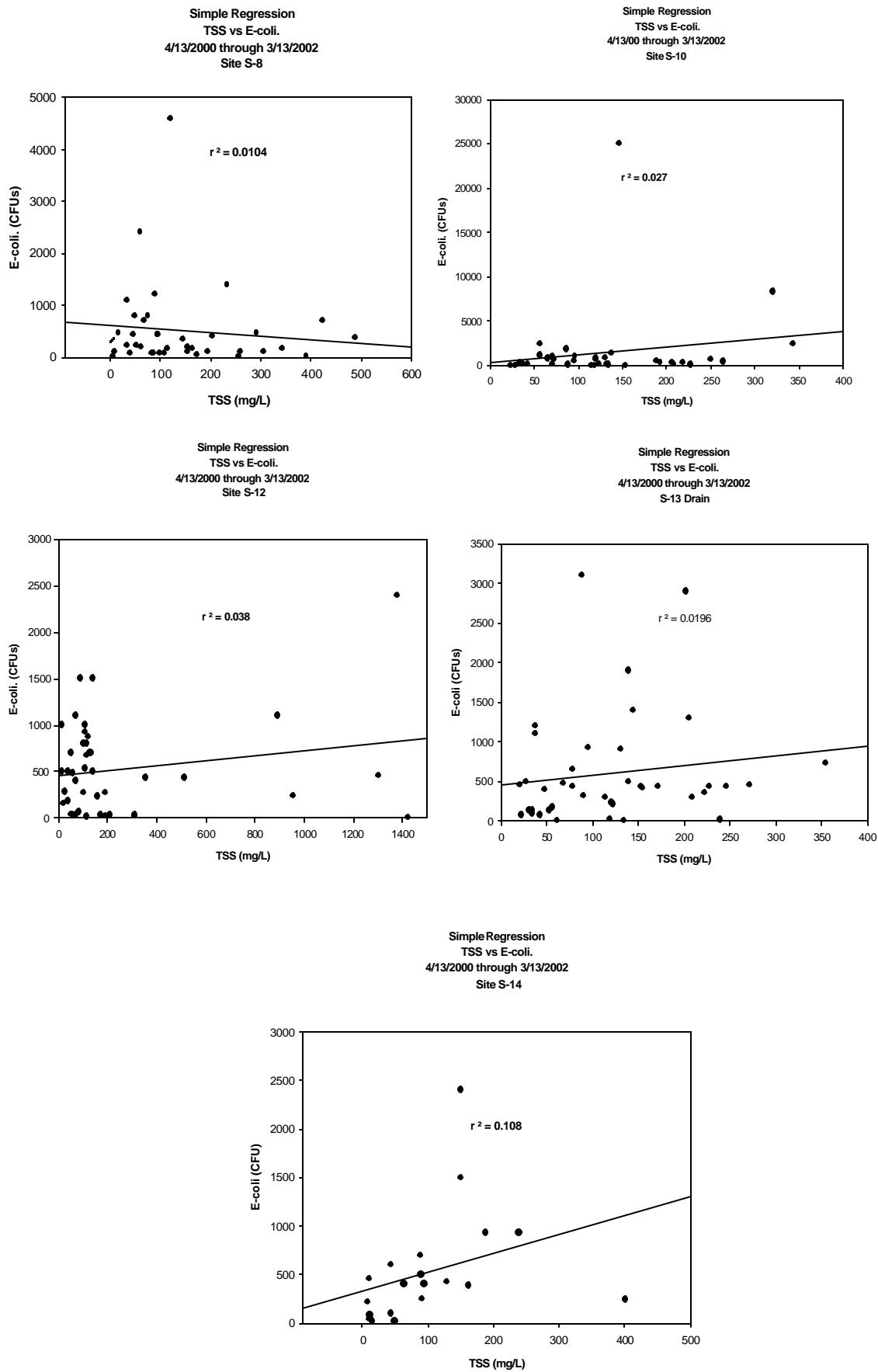
- Idaho Department of Environmental Quality. 2002. Snake River-Hells Canyon TMDL, Public Comment Draft.
- Idaho Department of Environmental Quality. 2002. Draft Lower Payette River TMDL Implementation Plan.
- Idaho Department of Environmental Quality. 1999. Lower Payette River Subbasin Assessment and Total Maximum Daily Load.

Appendix A

Simple Regression Total Phosphorus and Total Suspended Solids



Simple Regression Total Suspended Solids and *E-Coli*



Appendix B

S-14

Date	D.O.	Temp	%Sat	Conduct	TDS	pH	Discharge	Nitrate/nitrite	Total-P	Ortho-P	TSS	TVSS	Fecal	E-Coli
4/13/2000	8.02	13.1	76.1	501	251	7.89	2.05	3.68	0.15	0.08	26	4	1100	1100
4/25/2000	9.03	11.7	83	200	98	7.42	16	0.95	0.2	<0.05	131	11	440	380
5/10/2000	8.85	11.5	81.3	265	131	8.06	29.3	1.35	0.21	0.06	121	10	1200	540
5/25/2000	9.56	15	94.9	260	132	7.87	28	1.95	0.18	0.14	134	8	1400	120
6/8/2000	10.3	16.2	105	275	143	7.84	24.6	2.29	0.15	0.13	144	10	440	400
6/22/2000	9.9	16.6	101.5	289	147	7.75	23.5	2.58	0.23	0.13	92	7	3800	3800
7/6/2000	10.78	15.1	107	257	133	7.64	31.2	2.18	0.16	0.1	84	11	570	570
7/19/2000	9.51	17.9	100	289	144	7.62	29.7	2.25	0.18	0.09	76	5	870	370
8/3/2000	8.3	18.2	87.9	298	158	7.96	33.6	2.52	0.14	0.11	22	4	630	530
8/15/2000	8.03	16.4	81	319	159	7.78	42.5	3.27	0.18	0.16	25	2	1300	1000
8/31/2000	7.89	16.3	80.6	285	140	7.72	41.7	2.53	0.14	0.14	15	<2	2300	270
9/14/2000	7.87	16.2	80.2	255	129	7.8	31	1.94	0.13	0.07	16	3	1500	970
9/28/2000	8.56	13.1	81.4	312	155	7.96	29.2	3.36	0.09	0.08	26	2	330	170
10/12/2000	8.93	11.7	82.3	266	126	7.87	35.2	1.65	0.12	0.09	26	4	670	230
10/19/2000	9.1	12.3	85.3	263	132	7.91	23.70	1.56	0.07	<0.05	23	3	130	130
11/15/2000	9.6	9	82.5	713	361	8.24	3.64	6.61	0.2	0.12	91	8	100	33
12/12/2000	10.39	7.2	86.1	767	370	8.59	2.26	6.29	0.15	0.12	11	2	170	130
1/17/2001	10.82	3.4	81	748	378	8.31	1.87	7.06	0.2	0.09	6	2	43	43
2/22/2001	10.17	7.1	84	729	357	8.31	2.3	6.53	0.15	0.12	15	4	240	43
3/13/2002	10.49	6.9	86.3	753	382	8.12	2.1	6.59	0.08	0.08	9	5	220	220

Year 2

Date	D.O.	Temp	%Sat	Conduct	TDS	pH	Discharge	Nitrate/nitrite	Total-P	Ortho-P	TSS	TVSS	Fecal	E-Coli	
4/3/2001	na	na	na	770	371	8.16	1.98	6.86	0.12	0.09	11	3	460	460	
4/18/2001	7.34	11.2	66.8	159	80	8.04	20.7	0.2	0.56	0.09	401	29	430	240	
5/2/2001	6.86	8.7	59.1	230	113	8.06	16	1.58	0.3	0.09	189	17	930	930	
5/16/2001	7.2	13.4	59.1	214	107	7.89	28	1.47	0.33	0.15	150	12	2400	2400	
5/31/2001	7.54	14.9	72	224	111	7.78	37.2	1.51	0.34	0.13	162	7	390	390	
6/13/2001	7.42	12.3	68.2	282	139	7.71	22.3	2.24	0.21	0.09	130	11	430	430	
6/26/2001	7.39	16.6	70.2	337	172	7.88	31.3	2.61	0.36	0.12	239	15	1500	930	
7/12/2001	7.26	19.1	84	351	176	7.81	32.5	2.55	0.34	0.12	150	35	4900	1500	
7/19/2001	7.41	16.1	79.1	360	176	7.88	33.2	3.02	0.26	0.09	91	10	5500	250	
8/7/2001	8.02	18.2	85.2	369	189	7.87	26.9	3.09	0.27	0.15	90	8	500	500	
8/23/2001	7.97	16.6	81.8	406	202	8.07	28.6	4	0.26	0.12	89	9	700	700	
9/5/2001	8.22	16.8	85	364	182	na	29.2	3.02	0.22	0.1	95	9	800	400	
9/26/2001	9.21	14	89.5	323	158	7.71	23.3	2.62	0.12	0.09	64	7	400	400	
10/4/2001	9.62	13.3	92	380	185	7.69	21.2	2.42	0.11	0.05	44	5	600	600	
10/18/2001	10.38	9.7	91.2	375	181	7.84	20.20	2.98	0.11	0.07	50	4	100	<33	
11/15/2001	10.26	10	90.9	716	351	7.82	4.56	6.36	0.17	0.12	44	6	400	100	
12/12/2001	11.11	7.5	92.6	734	317	mlfx	4.11	6.34	0.17	0.11	16	2	33	<33	
9	1/17/2002	12.09	6.1	97	711	354	7.78	2.62	7.26	0.1	0.1	12	7	80	80
2/6/2002	11.94	3.7	89.7	713	365	7.86	1.97	6.9	0.07	0.07	12	6	70	40	
3/13/2002	10.49	6.9	86.3	753	382	8.12	1.86	6.59	0.08	0.08	9	5	220	220	

S-14 up	Date	D.O.	Temp	%Sat	Conduct	TDS	pH	Discharge	Nitrate/nitrite	Total-P	Ortho-P	TSS	TVSS	Fecal	E-Coli
4/13/2000	10.92	15.5	109.5	465	234	8.34	2.34	3.17	0.15	0.08	54	5	310	250	
4/25/2000	10.04	12.4	93.6	296	148	8.01	4.01	7.62	<0.05	<0.05	24	5	100	80	
5/10/2000	9.19	12.1	85.78	231	119	8.2	6.87	1.53	0.18	0.07	40	5	460	460	
5/25/2000	9.43	15.7	94.8	395	204	7.94	7.7	2.99	0.1	0.1	27	<2	3200	2200	
6/8/2000	9.01	15.6	90.4	491	247	7.67	6.6	2.96	0.18	0.18	10	<2	740	740	
6/22/2000	8.65	17.2	89.7	371	187	7.68	8.68	2.96	0.26	0.23	20	2	3700	3700	
7/6/2000	8.87	17	92	209	105	7.51	17.9	1.32	0.1	0.08	17	3	1100	600	
7/19/2000	8.66	18.7	93.6	248	125	7.51	18	1.9	0.14	0.09	29	2	270	270	
8/3/2000	6.91	18.4	73.3	334	169	7.87	12.8	2.69	0.17	0.05	47	12	1300	1300	
8/15/2000	6.51	16.5	66.6	413	207	7.85	11.5	4.01	0.2	0.16	35	<2	2500	1000	
8/31/2000	6.71	16.5	68.1	308	156	7.85	13.2	2.74	0.15	0.12	25	2	2100	270	
9/14/2000	6.49	15.8	65.6	311	157	7.68	9.95	2.19	0.11	0.08	18	2	1200	370	
9/28/2000	7.88	13.4	75.3	269	136	7.91	13.4	2.18	0.13	0.12	16	6	233	200	
10/14/2000	7.91	11.8	73.1	232	115	7.81	10.5	1.44	0.09	0.05	15	3	170	130	
10/19/2000	8.59	12.2	79.9	239	120	7.95	9.78	2.00	0.11	0.06	39	3	66	33	
11/15/2000	8.77	10.3	78.1	752	371	8.21	3.86	5.75	0.13	0.1	18	3	170	130	
12/13/2000	9.65	9.5	83.2	782	374	8.43	1.69	5.22	0.17	0.1	25	2	200	100	
1/31/2001	10.01	8.1	84.1	774	386	8.27	2.46	7.47	0.22	0.09	90	10	23	23	
2/22/2001	10.24	9.8	90.4	773	385	8.38	2.86	5.92	0.13	0.1	15	3	43	43	
3/14/2001	11.61	10.2	103.3	767	399	8.45	3.14	6.51	0.13	0.07	4	2	240	240	

Year 2

S-14 UP	Date	D.O.	Temp	%Sat	Conduct	TDS	pH	Discharge	Nitrate/nitrite	Total-P	Ortho-P	TSS	TVSS	Fecal	E-Coli
4/3/2001	11.62	9.3	101.6	796	398	8.32	2.02	6.38	0.17	0.09	4	1	240	93	
4/18/2001	9.07	12	84.3	134	68	7.99	12.1	0.23	0.23	0.08	193	15	2400	2400	
5/2/2001	9.35	11.2	85.2	137	68	8.07	13.2	0.54	0.27	0.05	193	14	230	230	
5/16/2001	8.89	14.9	87	183	92	7.98	12.9	0.93	0.22	0.08	91	8	230	230	
5/31/2001	8.67	17.7	92.8	200	103	7.92	16.9	1.36	0.23	0.12	58	12	2400	2400	
6/13/2001	8.85	14.9	86.9	247	123	8.09	17.9	1.74	0.21	0.14	36	5	430	430	
6/26/2001	6.88	16.3	70.2	470	238	8.01	13.7	3.91	0.12	0.1	33	<2	430	430	
7/12/2001	6.76	19.8	73.2	313	161	7.94	30.7	1.99	0.12	0.11	27	4	1600	970	
7/19/2001	6.46	16.7	64.5	369	194	7.93	20.9	2.54	0.17	0.1	26	3	2900	600	
8/7/2001	6.88	17.4	71.8	444	225	8.01	7.05	3.33	0.17	0.1	54	7	800	800	
8/23/2001	7.01	18	74.2	308	156	8.14	12.9	1.89	0.18	0.1	22	4	1500	1500	
9/5/2001	7.21	17.4	75.9	312	157	12.5	2	0.13	0.08	0.08	33	6	800	400	
9/26/2001	8.34	14.7	82.3	281	142	8.14	11.1	2.02	0.1	0.08	20	4	700	300	
10/4/2001	8.24	13.8	79	392	197	8	7.4	2.54	0.1	0.08	16	1	25000	200	
10/18/2001	9.55	10.3	85.1	314	154	8.08	8.54	2.14	0.13	0.05	75	9	400	66	
11/15/2001	9.99	11.6	91.4	734	364	8.23	6.94	5.36	0.14	0.10	56	7	1100	670	
12/12/2001					790	378	mlfx	2.58	0.2	0.08	46	7	<33	<33	
1/17/2002	9.96	8.9	86.5	776	367	8.01	2.22	5.37	0.17	0.07	69	7	70	50	
2/6/2002	10.51	7.5	87.7	767	381	8.33	1.62	6	0.13	0.08	53	7	30	30	
3/13/2002	11.56	10	102.6	764	385	8.44	1.54	5.77	0.12	0.08	13	4	50	40	

S-13	Date	D.O.	Temp	%Sat	Conduct	TDS	pH	Discharge	Nitrate/nitrite	Total-P	Ortho-P	TSS	TVSS	Fecal	E-Coli
4/13/2000	7.73	12.8	73	557	278	7.76	15	4.04	0.48	0.14	271	20	620	460	
4/25/2000	8.59	11.4	78.6	364	182	7.73	20.7	2.52	0.33	0.07	223	15	400	360	
5/10/2000	8.83	11.2	80.6	382	191	8.21	36	3.09	0.26	0.09	135	9	0	0	
5/25/2000	9.74	14.7	96.3	353	176	8.06	29.6	3.15	0.3	0.15	154	11	420	420	
6/8/2000	10.05	15.3	99.7	418	210	7.89	29.8	4.24	0.26	0.17	144	14	1400	1400	
6/22/2000	9.47	16.5	96.9	316	159	7.65	42.2	3.15	0.35	0.14	205	13	1300	1300	
7/6/2000	10.4	14.6	102.4	362	182	7.58	30.8	4.58	0.67	0.26	202	24	2900	2900	
7/19/2000	9.39	16.9	97.2	367	184	7.66	33.6	3.89	0.49	0.2	209	13	1600	300	
8/3/2000	7.39	17.6	77.6	410	209	7.95	33.1	4.38	0.37	0.24	119	11	5400	<33	
8/15/2000	7.82	15.3	78.1	440	222	7.93	33.8	5.27	0.4	0.24	140	8	8300	500	
8/31/2000	7.52	15	74.7	417	207	7.97	39.4	4.86	0.28	0.18	68	6	1500	470	
9/14/2000	7.43	15.6	74.6	361	180	7.93	44.8	3.54	0.18	0.11	28	3	1900	500	
9/28/2000	8.09	12.3	76	433	215	8	25.1	4.64	0.13	0.12	23	3	70	70	
10/12/2000	8.12	11.9	75.3	396	197	7.95	19.6	3.74	0.17	0.12	30	4	170	130	
10/19/2000	8.24	12.3	77.2	476	238	8	16.50	4.97	0.16	0.11	34	4	170	130	
11/15/2000	8.9	8.2	75.5	715	359	8.22	6.82	7.17	0.2	0.15	52	6	530	130	
12/13/2000	9.62	6.6	78.5	732	362	8.44	6.6	6.76	0.27	0.15	56	4	300	170	
1/31/2001	10.7	2.7	78.9	746	373	8.3	6.2	8.23	0.23	0.12	37	3	1100	1100	
2/22/2001	9.4	6.5	76.4	734	363	8.24	6.5	7.31	0.27	0.16	61	10	240	9	
3/14/2001	10.35	6.1	83.3	730	361	8.25	7.43	7.27	0.18	0.11	21	5	460	460	
Year 2															
4/3/2001	na	na	na	475	373	8.15	7.25	7.05	0.17	0.12	34	4	93	93	
4/18/2001	7.95	9.6	70	393	195	8.07	10.7	2.87	0.33	0.14	172	15	430	430	
5/2/2001	7.9	8.5	67.6	302	148	8.12	10.8	2.93	0.36	0.12	239	20	<30	15	
5/16/2001	7.32	13	65.3	360	179	8.02	36	3.68	0.43	0.17	227	13	430	430	
5/31/2001	7.25	13.9	65	379	189	8.02	33	3.62	0.29	0.18	95	9	930	930	
6/13/2001	7.35	11.9	66.2	341	167	7.87	45.3	3.28	0.44	0.21	246	20	430	430	
6/26/2001	7.28	16.3	75.3	359	180	7.86	47.9	3.33	0.38	0.15	153	16	430	430	
7/12/2001	7.21	19	79.8	482	241	8.04	22.8	4.51	0.64	0.17	355	25	1800	730	
7/19/2001	7.33	15.2	71.2	430	213	7.95	36.3	4.1	0.38	0.16	79	9	8400	650	
8/7/2001	7.27	17.4	75.9	493	246	8.01	34.4	5.15	0.43	0.25	140	11	18500	1900	
8/23/2001	8.33	16.2	84.6	484	240	8.06	40.2	4.6	0.3	0.12	130	11	>25000	900	
9/5/2001	8.18	15.6	82	527	262	7.27	27.3	5.39	0.31	0.18	113	11	900	300	
9/26/2001	8.71	13.1	83.1	423	208	7.91	31.2	3.91	0.16	0.13	89	9	5000	31000	
10/4/2001	8.74	12.5	82	469	233	7.93	19.3	3.51	0.17	0.11	48	5	400	400	
10/18/2001	10.42	8.4	88.8	435	210	7.94	18.6	3.65	0.19	0.11	78	10	8300	430	
11/15/2001	9.62	9.3	83.8	722	356	8.12	7.24	7.12	0.22	0.16	38	5	1200	1200	
12/12/2001	10.72	7.3	88.8	768	377	0	7.35	6.93	0.3	0.14	120	13	270	230	
1/17/2002	11.24	5.9	89.9	743	362	8.13	6.25	8.11	0.31	0.13	122	13	230	210	
2/6/2002	11.74	3.2	87.8	739	368	8.27	5	7.62	0.18	0.18	90	10	360	320	
3/13/2002	10.52	6.1	84.7	757	370	8.13	4.6	7.05	0.19	0.13	42	6	130	70	

S-13 East	Date	D.O.	Temp	%Sat	Conduct	TDS	pH	Discharge	Nitrate/nitrite	Total-P	Ortho-P	TSS	TVSS	Fecal	E-Coli
4/25/2000	No data														
5/10/2000	No data														
5/25/2000	8.1	14.8	79.8	314	160	7.95	0.34	2.88	0.29	0.09	171	9	1300	800	
6/8/2000	9.94	15.5	99.9	310	150	7.84	5.3	2.58	0.72	0.12	838	56	5100	3600	
6/22/2000	9.56	17.4	99.8	274	141	7.77	7.26	2.29	0.57	0.14	402	13	1600	900	
7/6/2000	9.46	16.3	96.6	246	125	7.83	7.88	1.7	0.19	0.09	74	10	900	670	
7/19/2000	9.16	1.8	96.9	306	154	7.62	7.76	2.42	0.32	0.14	137	9	770	430	
8/3/2000	6.81	19	73.4	389	195	7.82	4.64	3.44	0.33	0.14	120	17	1500	430	
8/15/2000	6.1	18.2	64.7	399	201	7.88	6.65	3.64	0.22	0.14	71	6	2300	1300	
8/31/2000	7.66	16	77.7	333	166	7.82	17.2	3.25	0.46	0.14	133	9	>8300	>8300	
9/14/2000	6.55	16.7	67.3	424	215	7.86	7.69	3.93	0.12	0.07	26	4	2700	900	
9/28/2000	8.1	12.6	76.1	455	230	7.9	5.1	4.37	0.22	0.18	56	8	1600	570	
10/14/2000	7.76	12.7	73.1	649	322	8.02	1.89	5.75	0.21	0.17	42	5	1000	800	
10/19/2000	8.18	13	77.5	699	349	8.09	1.51	6.68	0.20	0.16	67	7	33	33	
11/15/2000	8.72	11	78.8	746	361	8.23	0.91	6.17	0.25	0.13	91	10	2700	130	
12/13/2000	9.47	10.1	84	735	360	8.57	0.73	5.4	0.23	0.15	58	4	230	100	
1/31/2001	10.38	8.2	87.7	729	358	8.39	0.5	6.97	0.25	0.11	83	12	93	93	
2/22/2001	9.67	9.4	84.5	755	372	8.38	0.79	6.03	0.27	0.14	90	14	460	460	
3/14/2001	10.58	9.5	92.7	718	363	8.36	0.46	6.42	0.18	0.09	41	5	1100	1100	

Year 2

S-13 east	Date	D.O.	Temp	%Sat	Conduct	TDS	pH	Discharge	Nitrate/nitrite	Total-P	Ortho-P	TSS	TVSS	Fecal	E-Coli
4/3/2001	10.69	8.4	91.1	777	376	8.22	0.64	6.49	0.19	0.12	46	4	460	460	
4/18/2001	8.81	12.5	82.7	302	154	8.21	1.58	1.73	1.02	0.12	963	65	4600	4600	
5/2/2001	9.31	10.6	83.5	298	155	8.14	3.27	2.8	0.63	0.12	372	29	930	930	
5/16/2001	7.8	13.4	74.7	353	176	8.02	5.3	2.8	0.77	0.28	327	23	4600	4600	
5/31/2001	9.86	15.5	98.5	323	165	7.88	6.96	2.83	0.81	0.23	445	38	2400	2400	
6/13/2001	8.34	13.2	79.6	277	139	8.13	8.63	1.82	0.27	0.13	180	17	1500	1500	
6/26/2001	9.14	18	95.2	281	141	8.02	8.1	2	0.36	0.09	267	12	>24000	11000	
7/12/2001	6.95	19.1	72.2	447	227	8.13	6.1	4.18	0.94	0.29	468	48	>8300	770	
7/19/2001	9.35	16.4	95.6	395	197	7.93	7.32	3.1	0.44	0.13	202	22	12600	12600	
8/7/2001	7.62	19.8	83.4	407	205	8.19	8.52	3.33	0.38	0.17	237	14	5100	2400	
8/23/2001	7.91	16.6	81.1	522	260	8.22	8.33	4.65	0.83	0.61	93	10	1700	1700	
9/5/2001	7.44	17.6	78	544	274	6.69	5.35	0.58	0.51	0.31	7	400	400	400	
9/26/2001	9.18	13.1	87.1	637	322	8.22	3.1	5.95	0.42	0.41	39	5	700	700	
10/4/2001	9.13	13	86.6	717	361	8.17	1.51	5.77	0.2	0.15	86	9	700	700	
10/18/2001	9.2	11.9	85.2	762	368	8.13	3.1	5.86	0.14	0.13	11	3	6300	370	
11/15/2001	10.4	12	96.6	739	361	8.3	2.43	6.13	0.19	0.15	53	6	100	100	
12/12/2001					755	367		2.15	5.89	0.26	0.1	78	10	430	170
1/17/2002	11.02	9.3	95.7	755	361	8.28	0.48	6.56	0.44	0.1	263	26	80	20	
2/6/2002	10.61	8	89.6	747	368	8.44	0.42	6.8	0.3	0.11	203	16	20	<10	
3/13/2002	10.88	9.7	96	734	363	8.54	0.39	6.52	0.22	0.11	56	6	720	360	

S-13 west

Date	D.O.	Temp	%Sat	Conduct	TDS	pH	Discharge	Nitrate/nitrite	Total-P	Ortho-P	TSS	TVSS	Fecal	E-Coli
4/13/2000	8.3	13.8	80.3	255	127	7.67	3.3	1.05	0.48	0.17	191	17	780	460
4/25/2000	8.2	12.1	77.6	650	323	7.98	1.48	3.81	0.06	0.06	23	4	40	40
5/10/2000	9.08	11.5	83.2	495	250	8.18	3.46	3.14	0.38	0.14	148	10	240	220
5/25/2000	8.3	15.2	82.7	381	197	7.83	8	2.73	1.03	0.57	277	15	2600	2000
6/8/2000	9.81	15.4	98.2	373	188	7.73	7	2.66	0.15	0.15	86	10	780	780
6/22/2000	9.71	16	98.6	457	232	7.55	5.24	3.79	0.33	0.29	47	3	830	830
7/6/2000	9.38	17.1	96.9	381	192	7.61	8.87	3.33	0.72	0.55	130	14	700	700
7/19/2000	9.29	17.2	96.2	420	213	7.71	12.8	4.1	0.72	0.52	74	5	330	67
8/3/2000	8.32	17.5	87.2	417	209	8	9.41	4.13	0.48	0.37	72	19	>8300	>8300
8/15/2000	8.15	16.5	83.6	380	196	7.97	11.2	3.56	0.44	0.37	57	4	570	570
8/31/2000	8.25	15.2	82.3	477	247	7.98	7.3	4.46	0.24	0.23	24	<2	2500	170
9/14/2000	8.14	15	80.7	460	234	8.02	6.07	4.41	0.24	0.2	30	5	330	270
9/28/2000	9.13	13.2	87.2	382	202	8.1	5.84	3.67	0.09	0.09	10	4	70	70
10/14/2000	8.87	11.8	82	315	156	7.98	6.53	2.56	0.14	0.1	20	3	330	230
10/19/2000	9.33	12.1	87	415	211	8.2	4.10	3.61	0.10	0.07	14	3	130	33
11/15/2000	10.35	9.6	90.5	738	354	8.38	1.04	5.37	0.14	0.11	19	3	66	66
12/13/2000	10.7	8.8	92.3	745	361	8.58	0.72	4.84	0.15	0.1	11	<2	1200	500
1/31/2001	10.6	7.3	88.1	734	367	8.43	0.61	6.51	0.15	0.09	12	6	43	23
2/22/2001	10.07	9.1	87.4	732	367	8.45	0.79	5.05	0.15	0.1	11	5	93	93
3/14/2001	10.42	9.2	90.6	720	366	8.46	0.75	7.23	0.13	0.06	6	2	4	4

Year 2

Date	D.O.	Temp	%Sat	Conduct	TDS	pH	Discharge	Nitrate/nitrite	Total-P	Ortho-P	TSS	TVSS	Fecal	E-Coli	
4/3/2001	10.68	8.2	90.7	763	378	8.27	0.57	4.92	0.15	0.09	36	4	240	240	
4/18/2001	9.23	12	85.6	201	102	8.19	2.67	0.42	0.25	0.1	164	14	150	150	
5/2/2001	9.3	10.9	84.1	271	139	8.16	4.78	1.66	0.34	0.12	181	15	40	40	
5/16/2001	7.93	14.1	77.1	386	195	8.09	3.8	2.87	0.24	0.15	59	6	150	150	
5/31/2001	8.28	15.4	83.5	375	191	7.95	6.43	3.47	0.45	0.24	188	17	930	430	
6/13/2001	8.21	14.1	79.6	337	170	8.09	8.72	2.8	0.59	0.24	261	18	930	930	
6/26/2001	8.1	16.7	83.2	396	199	8.06	9.73	3.63	0.41	0.21	187	17	930	210	
7/12/2001	8.09	16.7	82.8	515	263	8.07	5.98	4.49	0.22	0.14	40	4	400	370	
7/19/2001	9.64	15.8	97.6	440	221	8.05	9.85	4.15	0.41	0.23	105	12	2600	750	
8/7/2001	8.4	16.9	87.1	531	269	8.16	4.35	4.79	0.39	0.24	108	9	7600	4100	
8/23/2001	8.35	16.3	85.3	512	269	8.23	7.72	5.1	0.43	0.22	94	11	800	600	
9/5/2001	9.04	15.4	89.3	574	290	8.17	4.58	5.32	0.52	0.34	130	11	400	400	
9/26/2001	9.66	13	92	418	212	8.29	5.38	4.45	0.24	0.17	57	7	700	300	
10/4/2001	9.64	13.2	92	460	239	8.2	3.38	3.82	0.11	0.08	23	5	600	600	
10/18/2001	11.44	7.9	96.5	392	194	8.17	4.39	3.08	0.18	0.14	37	5	470	230	
11/15/2001	10.35	10.6	93.5	719	359	8.46	2.39	5.87	0.15	0.12	31	4	66	66	
12/12/2001				787	369			2.78	5.56	0.29	0.1	95	10	66	66
1/17/2002	11.29	8.2	95.5	770	372	8.14	1.02	6.08	0.16	0.09	68	11	60	60	
2/6/2002	11.29	6.7	93.7	738	370	8.42	1.15	5.79	0.15	0.09	77	7	40	40	
3/13/2002	10.28	8.8	88.4	726	368	8.4	1.09	5.25	0.15	0.09	43	7	30	30	

S-12	Date	D.O.	Temp	%Sat	Conduct	TDS	pH	Discharge	Nitrate/nitrite	Total-P	Ortho-P	TSS	TVSS	Fecal	E-Coli
4/13/2000	8.28	12	77.1	979	489	8.12	0.74	0.21	0.24	0.23	0.17	23	4	240	160
4/25/2000	8.31	10.8	75.2	823	412	7.82	0.94	7.25	0.2	0.17	0.14	26	4	280	280
5/10/2000	9.54	10.8	86.2	786	389	8.32	2.21	6.99	0.19	0.14	0.15	3	500	500	500
5/25/2000	9.84	12.8	92.9	577	292	8.04	3.9	5.4	0.28	0.2	0.40	2	480	480	180
6/8/2000	10.8	13.9	104.7	508	254	8.05	5.3	5.79	0.19	0.19	0.56	2	780	480	480
6/22/2000	9.33	15.3	93.1	386	195	7.74	6.3	4.36	0.32	0.21	0.21	123	10	2900	870
7/6/2000	10.45	14.6	102.6	318	160	7.68	11.7	3.37	0.26	0.15	0.68	9	500	400	400
7/19/2000	9.15	15.5	91.6	474	239	7.72	11.6	6.15	0.37	0.22	0.81	5	530	67	67
8/3/2000	7.88	16.7	81	427	216	8.02	12.3	5.3	0.28	0.17	0.68	8	3900	1100	1100
8/15/2000	7.98	14.7	79	473	236	8	8.52	5.71	0.24	0.21	0.41	5	1600	500	500
8/31/2000	7.66	14.1	74.8	421	210	7.89	8.88	5.47	0.2	0.13	0.13	<2	3300	1000	1000
9/14/2000	7.17	15.3	71.7	336	169	7.86	4.2	3.7	0.25	0.09	0.107	13	1400	1000	1000
9/28/2000	8.46	11.6	78	403	205	7.95	4.1	5.09	0.26	0.17	0.103	8	470	270	270
10/12/2000	7.55	11.6	69.5	437	218	7.97	3.14	5.15	0.32	0.13	0.190	15	500	270	270
10/19/2000	8.18	11.8	75.5	479	240	8.03	2.11	6.19	0.29	0.12	0.160	13	400	230	230
11/15/2000	10.17	7.1	83.8	799	397	8.25	1.9	10.4	0.32	0.23	0.73	7	130	33	33
12/13/2000	10.53	6.1	85.7	820	402	8.44	1.28	9.38	0.51	0.26	0.207	14	33	33	33
1/31/2001	11.41	3.1	84.1	818	400	8.36	0.69	1.1	0.78	0.21	0.893	49	1100	1100	1100
2/22/2001	10.11	6.4	82.1	824	408	8.31	0.8	11.1	0.81	0.24	0.1380	82	>2400	>2400	>2400
3/14/2001	10.61	5.8	84.5	812	401	8.29	0.81	10.3	0.19	0.19	0.1300	94	460	460	460
Year 2															
Date	D.O.	Temp	%Sat	Conduct	TDS	pH	Discharge	Nitrate/nitrite	Total-P	Ortho-P	TSS	TVSS	Fecal	E-Coli	
4/3/2001	12.61	5.1	99.1	853	414	8.23	1.03	9.98	0.4	0.22	192	16	43	23	
4/18/2001	7.97	10.6	71.9	292	144	8.03	2.4	2.11	1.05	0.14	958	56	430	240	
5/2/2001	8.17	8.1	69.3	374	185	8.11	6.46	5.36	0.59	0.21	356	26	430	430	
5/16/2001	7.2	12.8	67.8	348	174	8	7.48	4.67	0.72	0.2	512	31	930	430	
5/31/2001	8.97	14.7	80.2	285	142	7.96	5.46	3.18	0.39	0.14	143	17	1500	1500	
6/13/2001	9.2	11.9	91.2	274	135	7.97	13.1	2.74	0.23	0.15	55	6	230	40	
6/26/2001	7.88	16.1	82.6	342	172	7.98	8.33	3.65	0.17	0.14	108	18	1500	930	
7/12/2001	7.26	19	74.2	349	174	7.95	8.12	3.2	0.28	0.13	110	10	1700	530	
7/19/2001	9.12	15.8	90.3	362	179	7.95	9.2	3.6	0.21	0.11	91	9	8400	1500	
8/7/2001	7.65	17.4	76.5	515	258	8.03	9.02	4.74	0.3	0.24	51	6	16000	700	
8/23/2001	8.34	16.3	84.9	467	232	8.31	17	4.63	0.28	0.12	116	11	800	800	
9/5/2001	8.41	15.3	84	503	251	na	6.6	5.93	0.35	0.22	103	10	2000	800	
9/26/2001	8.94	12.8	84.7	372	183	7.84	6.39	4.36	0.3	0.16	131	12	5100	700	
10/4/2001	8.96	11.1	81.5	473	234	8.02	3.6	5.43	0.32	0.16	141	13	500	500	
10/18/2001	10	8.9	85.8	462	225	8.04	4.92	5.29	0.2	0.11	115	8	>8300	670	
11/15/2001	9.64	8.7	89	783	388	8.25	2.16	10.20	0.34	0.22	118	12	<33	<33	
12/12/2001	10.42	7.1	87	842	412	3.17	10.3	0.43	0.21	0.174	174	16	66	33	
1/17/2002	11.17	6	91.3	838	404	8.3	0.88	11.2	0.52	0.22	309	22	40	40	
2/6/2002	11.65	3.2	88	822	406	8.32	0.34	10.8	0.47	0.23	312	18	80	20	
3/13/2002	10.5	5.3	82.7	819	406	8.25	0.32	8.58	0.2	0.2	1420	99	10	<10	

S-10	Date	D.O.	Temp	%Sat	Conduct	TDS	pH	Discharge	Nitrate/nitrite	Total-P	Ortho-P	TSS	TVSS	Fecal	E-Coli
4/13/2000	8.42	13.7	81.1	205	103	7.64	13.7	0.67	0.36	0.06	219	15	660	370	
4/25/2000	8.61	12.5	80.7	288	144	7.72	10.5	1.61	0.18	<0.05	115	10	120	20	
5/10/2000	8.92	12.5	83.8	340	169	8.14	11.2	1.57	0.15	0.05	49	5	na	na	
5/25/2000	drain submerged by Payette R. water														
6/8/2000	9.74	16.9	100.6	257	128	7.91	19	1.59	0.26	0.12	208	13	2300	160	
6/22/2000	10.23	15.2	101.4	395	202	7.96	5.8	3.25	0.28	0.14	131	11	900	900	
7/6/2000	10.3	14.7	101.5	318	160	7.88	15.3	2.33	0.45	0.16	264	24	500	400	
7/19/2000	10.43	16.1	106.3	378	190	7.72	6.3	3.34	0.64	0.14	206	12	370	330	
8/3/2000	8.27	16.4	84.4	430	218	7.95	4.07	4.39	0.34	0.24	72	9	1100	690	
8/15/2000	9.03	14.4	88.4	441	220	7.94	8.83	4.41	0.41	0.27	137	9	1400	1400	
8/31/2000	8.51	16.2	86.6	240	132	8.02	28.8	2.26	0.57	0.13	321	23	>8300	>8300	
9/14/2000	8.42	16.6	86.3	223	110	7.92	29	1.51	0.36	0.05	250	50	700	670	
9/28/2000	9.02	13.4	86.3	217	107	8.09	32.4	1.29	0.39	0.06	120	10	1200	800	
10/12/2000	9.42	11.8	86.8	230	113	8.1	32	1.2	0.29	0.08	193	15	330	300	
10/19/2000	9.3	12.2	86.7	358	177	8.15	12.30	3.09	0.22	0.09	132	10	170	170	
11/15/2000	10.88	8.4	92.7	616	300	8.42	3.95	5.51	0.17	0.13	23	<2	66	<33	
12/13/2000	10.62	7.2	87.7	624	306	8.54	3.1	5.54	0.2	0.14	37	3	270	130	
1/31/2001	11.79	3.8	89.5	628	310	8.28	2.59	7.13	0.2	0.12	29	4	23	23	
2/22/2001	10.46	7.5	87.1	643	311	8.43	3.08	5.65	0.25	0.13	88	11	43	43	
3/14/2001	11.22	6.4	91.2	609	300	8.42	2.56	6.92	0.17	0.09	33	4	240	240	

Year 2

S-10	Date	D.O.	Temp	%Sat	Conduct	TDS	pH	Discharge	Nitrate/nitrite	Total-P	Ortho-P	TSS	TVSS	Fecal	E-Coli
4/3/2001	11.85	5.7	94.4	676	332	8.28	5.21	6.72	0.44	0.14	344	24	>2400	>2400	
4/18/2001	8.57	12	79.8	190	94	8.08	18	0.68	0.29	0.08	188	15	430	430	
5/2/2001	8.53	9.2	74.3	262	129	8.15	11.8	2.34	0.27	0.11	124	11	210	210	
5/16/2001	7.64	13.6	73.7	270	135	8.14	15.2	2.55	0.41	0.28	95	8	430	430	
5/31/2001	7.45	14.2	72.6	318	159	8.02	8.29	2.4	0.26	0.18	56	11	2400	2400	
6/13/2001	7.89	12.2	73.7	324	157	8.05	11.5	2.27	0.29	0.19	65	12	1200	750	
6/26/2001	8.35	16.4	85.2	340	171	8.18	15.1	2.55	0.19	0.15	43	7	930	210	
7/12/2001	8.65	17.5	91.2	445	224	8.03	6.3	3.16	0.28	0.22	77	9	>8300	>8300	
7/19/2001	9.63	15.6	96.2	392	195	7.98	10.9	4.11	0.28	0.17	120	13	5300	600	
8/7/2001	9.85	18.3	105	391	195	8.15	13.9	3.11	0.31	0.25	57	9	6000	1100	
8/23/2001	8.73	15.7	87.9	427	213	8.17	17	3.85	0.37	0.16	96	10	1000	1000	
9/5/2001	8.97	15	88.8	465	233	na	13.1	3.96	0.45	0.27	146	12	>25000	>25000	
9/26/2001	9.6	13.2	91.6	352	174	7.9	20.1	2.96	0.23	0.13	86	8	5500	1800	
10/4/2001	9.49	13.4	90.8	325	160	8.02	17.4	1.89	0.17	0.09	71	6	1000	1000	
10/18/2001	10.82	9.6	94.9	314	149	8.05	13.7	2.06	0.13	0.07	71	8	>8300	66	
11/15/2001	10.54	9.4	92	614	300	8.24	5.54	0.63	0.25	0.14	118	12	66	<33	
12/12/2001	10.92	7.6	91.2	648	314	mlfx	4.87	6.46	0.37	0.13	154	14	66	16	
1/17/2002	11.45	6.3	92.7	666	317	8.11	3.04	7.36	0.38	0.12	227	14	50	40	
2/6/2002	12.16	3.7	92.1	653	322	8.26	2.19	7.51	0.24	0.15	134	10	110	110	
3/13/2002	10.84	6.4	87.9	656	324	8.3	2.02	6.97	0.25	0.12	134	10	120	20	

S-10 up	Date	D.O.	Temp	%Sat	Conduct	TDS	pH	Discharge	Nitrate/nitrite	Total-P	Ortho-P	E-Coli
4/13/2000	8.95	13.5	86.2	221	110	7.82	18	0.51	0.1	<0.05	45	460
4/25/2000	8.87	12.5	83	228	113	7.57	11.8	1.03	0.08	<0.05	22	120
5/10/2000	8.82	12.3	82.6	212	106	8.22	19.6	1.02	0.13	0.05	32	520
5/25/2000	8.81	15.6	88.4	232	118	8.02	12.6	1.44	0.66	0.14	479	>5000
6/8/2000	9.76	16.9	100.9	237	118	7.85	16.7	1.34	0.12	0.12	72	40
6/22/2000	10.25	15.9	103.8	390	199	7.74	8.9	2.54	0.17	0.12	72	1000
7/6/2000	9.46	15.6	94.9	307	155	7.56	12.9	1.88	0.49	0.17	314	1100
7/19/2000	9.48	16.8	97.8	340	172	7.61	13.5	2.36	0.32	0.17	173	3500
8/3/2000	7.74	16.8	80.1	336	169	7.98	14.2	2.32	0.55	0.25	261	2000
8/15/2000	7.98	15.6	80.5	375	187	7.97	16.3	2.62	0.77	0.3	420	2100
8/31/2000	7.92	17.2	82.2	234	117	7.94	24.4	1.4	0.4	0.12	37	>8300
9/14/2000	7.99	17.3	83.2	195	98	7.84	25.3	0.87	0.13	0.06	58	230
9/28/2000	8.76	13.9	84.3	198	95	8.04	27.9	0.81	0.11	0.06	46	830
10/14/2000	8.97	11.9	83.1	216	106	7.91	28.7	0.85	0.15	0.08	43	100
10/19/2000	8.83	12.3	82.6	329	164	8.12	7.89	2.21	0.10	0.08	41	170
11/15/2000	10.39	10.4	93	550	264	8.31	2.31	3.83	0.13	0.12	7	33
12/13/2000	10.4	9.4	91.5	555	266	8.55	4.92	3.63	0.15	0.11	7	<33
1/31/2001	11.14	7.5	93.2	561	275	8.47	1.59	4.69	0.17	0.11	13	23
2/22/2001	9.97	9.4	87.4	564	279	8.39	2.48	4.3	0.12	0.12	30	240
3/14/2001	10.79	9	93.2	557	280	8.4	1.94	4.5	0.14	0.09	11	3
Year 2												
S-10Up	Date	D.O.	Temp	%Sat	Conduct	TDS	pH	Discharge	Nitrate/nitrite	Total-P	Ortho-P	E-Coli
4/3/2001	10.57	7.6	88.4	510	244	8.16	1.94	3.49	0.18	0.12	42	6
4/18/2001	8.67	12.5	81.4	190	95	8.24	17.1	0.34	0.19	0.08	123	11
5/2/2001	8.58	10.8	77.5	247	124	8.09	10.9	1.57	0.12	0.1	42	5
5/16/2001	8.79	13.8	85.2	258	129	8.01	21.2	1.7	0.33	0.27	62	8
5/31/2001	8.89	15.4	86.5	267	132	8.02	17.1	1.55	0.22	0.19	26	4
6/13/2001	8.9	13.6	84.6	270	137	8.17	13.2	1.46	0.26	0.21	43	3
6/26/2001	9.49	16.8	98.4	307	157	8.27	20.2	1.84	0.17	0.16	33	210
7/12/2001	7.89	17.1	82.2	382	192	8.05	22.1	2.64	0.3	0.27	36	4
7/19/2001	7.92	17	83.2	306	153	8.01	23.5	1.61	0.37	0.15	162	16
8/7/2001	7.97	18.9	85.9	330	166	8.13	20.1	2.11	0.52	0.19	151	11
8/23/2001	8.29	15.9	84.2	386	193	8.28	22.6	2.55	0.46	0.15	172	15
9/5/2001	8.22	15.1	81.7	410	208	13	2.43	0.36	0.23	0.12	133	10
9/26/2001	9.24	13.9	89.5	310	155	8.28	15.1	1.94	0.14	0.11	56	5
10/4/2001	9.27	14.1	90.1	287	143	8.14	14.4	1.08	0.13	0.09	38	400
10/18/2001	10.59	10.4	94.6	266	130	8.09	13.6	1.2	0.08	0.06	25	33
11/15/2001	10.71	11.1	97.9	534	265	8.3	3.56	4.15	0.18	0.12	58	<33
12/12/2001				570	275						no data	>25000
1/17/2002	10.4	8.6	89.2	577	281	8.27	2.95	4.83	0.21	0.1	93	12
2/6/2002	11.21	6.8	92.3	576	286	8.21	2	4.8	0.17	0.12	59	8
3/13/2002	11.02	8.5	94.3	577	285	8.27	2.14	4.74	0.10	0.10	16	4

S-8	Date	D.O.	Temp	%Sat	Conduct	TDS	pH	Discharge	Nitrate/nitrite	Total-P	Ortho-P	TVSS	TSS	Fecal	E-Coli
4/13/2000	no sample	9.06	11.8	83.6	340	169	7.86	7	1.4	0.3	0.06	204	19	420	420
4/25/2000		9.29	11.4	85	320	158	8.28	7.67	1.3	0.17	0.07	47	7	500	440
5/10/2000		9.45	15.4	94.7	276	141	7.99	14.7	1.19	0.4	0.1	259	15	600	100
5/25/2000		10.58	16.7	108.4	297	149	8.13	14.4	1.32	0.15	0.1	144	14	360	360
6/8/2000		10.09	16.5	103.5	349	176	7.91	8	1.76	0.21	0.13	75	6	800	800
6/22/2000		10.61	15.2	105.6	320	160	7.75	19.5	1.63	0.39	0.12	292	26	700	470
7/6/2000		9.97	16.5	101.9	395	198	7.77	9.8	2.77	0.64	0.16	488	36	500	370
7/19/2000		8.75	17.8	92.2	337	168	8.14	9.87	2.04	0.52	0.17	391	21	165	33
8/3/2000		9.14	15.2	91.2	416	207	8.14	10.2	2.76	0.25	0.14	154	12	360	200
8/15/2000		8.31/2000	9.08	89.2	423	211	8.14	11.2	2.84	0.16	0.14	94	4	1300	430
9/14/2000		8.82	14.8	87.3	429	215	8.09	16	2.48	0.44	0.13	307	24	770	100
9/28/2000		9.24	13	87.6	310	153	8.15	21.5	1.55	0.25	0.09	114	10	1200	170
10/14/2000		9.5	12	88.4	316	156	8.09	20.4	1.43	0.21	0.1	89	6	1700	1200
10/19/2000		9.62	12.4	90.1	419	208	8.22	10.70	2.41	0.19	0.10	86	8	66	66
11/15/2000		11.13	8.4	95	585	287	8.51	4.73	3.28	0.16	0.13	7	<2	33	<33
12/13/2000		11.1	7	921	595	291	8.64	3.75	3.27	0.18	0.14	8	<2	300	100
1/31/2001		12.4	3.3	92.8	593	286	8.58	1.59	3.91	0.17	0.11	17	5	460	460
2/22/2001		11.05	7.3	91.8	596	294	8.52	2.88	3.71	0.22	0.16	52	12	240	240
3/14/2001		11.13	6.3	90.8	597	295	8.46	2.9	3.61	0.17	0.09	34	6	240	240

Year 2

S-8	Date	D.O.	Temp	%Sat	Conduct	TDS	pH	Discharge	Nitrate/nitrite	Total-P	Ortho-P	TVSS	TSS	Fecal	E-Coli
4/3/2001	12.26	5.5	97.5	705	332	8.37	2.31	3.54	0.14	0.1	34	4	1100	1100	
4/18/2001		8.74	11.9	81	236	117	8.21	8.6	0.73	0.26	0.09	174	16	240	40
5/2/2001		8.68	9.4	75.9	270	134	8.16	8.2	1.72	0.27	0.17	96	12	430	430
5/16/2001		9.11	13.8	84.2	290	144	8.11	14.3	1.84	0.29	0.14	121	11	4600	4600
5/31/2001		9.07	14.5	90.1	297	148	7.98	16.4	1.52	0.3	0.14	99	10	90	90
6/13/2001		9.46	88.3	76.9	332	165	8.2	20.1	1.61	0.24	0.12	60	9	2400	2400
6/26/2001		10.59	16.5	104.2	359	182	8.38	12.7	1.8	0.18	0.11	82	8	90	90
7/12/2001		8.89	18.6	97.2	184	8.01	8.22	11.5	1.73	0.4	0.21	233	22	2700	1400
7/19/2001	no sample	a area being	Heavily	dusted	by	aircraft									
8/7/2001		8.52	17.5	89.2	406	204	8.16	15	2.73	0.57	0.19	424	22	4500	700
8/23/2001		9.1	15.7	91.5	448	224	8.21	8.68	3.09	0.24	0.11	62	8	500	200
9/5/2001		9.39	15.4	94	454	228	na	13.2	2.38	0.29	0.13	154	21	500	100
9/26/2001		10.06	12.4	94.3	463	228	8.22	8.79	3.17	0.23	0.17	49	8	1500	800
10/4/2001		10.11	12.7	95.3	411	203	8.21	10	1.88	0.17	0.12	68	7	700	700
10/18/2001		11.21	9.1	97.3	401	197	8.19	10.3	2.08	0.44	0.09	342	25	>8300	170
11/15/2001		10.64	9.5	93.1	571	283	8.44	4.14	3.70	0.31	0.14	163	14	230	170
12/12/2001															
1/17/2002		11.87	5.8	95.2	609	297	8.42	2.23	4.32	0.35	0.12	195	17	100	100
2/6/2002		12.37	3.1	92.4	608	303	8.49	2.22	4.2	0.44	0.13	107	10	240	90
3/13/2002		11.58	6	93.4	599	297	8.56	0.12	40	0.12	0.14	256	21	100	33

S-8 UP	Date	D.O.	Temp	%Sat	Conduct	pH	Discharge	Nitrate/nitrite	Total-P	Ortho-P	TSS	TVSS	Fecal	E-Coli
4/13/2000	8.76	13.1	83.7	300	149	7.87	6.2	1.05	0.37	0.1	244	18	620	500
4/25/2000	8.83	11.9	82.1	334	166	7.65	8.5	1.28	0.29	0.05	208	16	460	460
5/10/2000	8.7	11.9	80.6	301	151	8.2	11.9	1.18	0.23	0.07	114	10	400	240
5/25/2000	98.91	15.4	88.8	236	120	7.91	12.2	0.83	0.26	0.08	165	10	880	240
6/8/2000	9.85	16.2	100	339	171	7.91	11.5	1.16	0.19	0.1	162	12	2400	1200
6/22/2000	9.32	16.4	94.8	330	167	7.76	12.6	1.3	0.24	0.1	147	9	2800	2800
7/6/2000	9.57	15	95.2	326	165	7.74	15.6	1.42	0.26	0.12	136	16	500	230
7/19/2000	10.01	16.4	102.3	362	182	7.63	14.1	1.37	0.24	0.14	120	7	500	270
8/3/2000	7.25	17.2	75.1	333	166	7.93	19.8	1.4	0.2	0.17	42	8	6500	6500
8/15/2000	7.75	15.8	78	344	173	7.94	19.9	1.49	0.12	0.12	25	<2	1700	1700
8/31/2000	7.87	14.9	77.4	375	188	7.85	17.6	1.89	0.16	0.13	15	2	2500	2500
9/14/2000	7.47	14.9	73.8	414	208	7.98	13.4	1.82	0.16	0.13	27	5	1300	200
9/28/2000	8.13	13.3	77.7	299	148	8	22.2	1.45	0.09	0.09	30	2	630	70
10/14/2000	8.31	12	76.1	326	159	7.89	23.1	1.42	0.15	0.1	26	4	1300	1200
10/19/2000	8.29	12.5	78	446	222	8.1	8.86	2.40	0.16	0.11	26	4	100	33
11/15/2000	9.81	9.5	85.6	578	284	8.31	3.98	3.21	0.15	0.14	8	<2	33	33
12/13/2000	10.2	8.6	87.1	593	285	8.49	4.05	3.16	0.18	0.14	13	<2	170	33
1/31/2001	11.1	6.1	89.1	596	295	8.41	2.56	3.77	0.12	0.12	21	5	1100	1100
2/22/2001	10.01	8.8	86.4	585	287	8.41	3.34	3.37	0.17	0.14	33	7	460	460
3/14/2001	10.79	8	91.2	571	291	8.39	3.22	3.54	0.16	0.1	17	3	93	93

Year 2

S-8 UP	Date	D.O.	Temp	%Sat	Conduct	pH	Discharge	Nitrate/nitrite	Total-P	Ortho-P	TSS	TVSS	Fecal	E-Coli
4/3/2001	11.31	6.9	93.1	441	214	8.25	3.9	2.25	0.2	0.11	70	8	>2400	1100
4/18/2001	8.64	12.2	80.6	228	114	8.23	10.13	0.71	0.23	0.08	151	12	240	240
5/2/2001	8.55	10.4	76.4	234	117	8.06	12.9	0.97	0.37	0.15	186	14	4600	4600
5/16/2001	8.64	13.9	84.3	252	126	7.99	14.8	0.98	0.22	0.12	62	7	930	930
5/31/2001	7.89	14.9	75.3	273	139	7.89	13.1	1.13	0.24	0.13	87	12	430	430
6/13/2001	7.99	12.6	75.1	297	149	7.97	17.4	1.09	0.19	0.11	50	3	930	930
6/26/2001	9.88	16.1	101.3	340	177	8.03	15.8	1.42	0.17	0.11	52	<2	210	210
7/12/2001	7.33	18.3	76.2	352	178	7.98	14.3	1.23	0.13	0.1	51	6	2900	300
7/19/2001	9.84	16.2	100.2	313	156	7.89	17	0.91	0.17	0.12	40	6	2200	600
8/7/2001	7.43	17.6	77.1	362	182	8.02	15.5	1.28	0.16	0.13	49	4	1400	1400
8/23/2001	7.74	16	78.4	398	199	8.21	13.8	2.11	0.19	0.1	42	6	800	200
9/5/2001	8.12	15.3	80.9	452	232	10.3	1.99	0.19	0.14	0.14	41	6	1000	300
9/26/2001	9.13	12.9	86.3	453	227	8.16	9.66	2.31	0.14	0.13	35	5	1500	200
10/4/2001	9.07	12.8	86	428	213	8.16	7.27	1.9	0.14	0.12	35	2	1400	1400
10/18/2001	10.5	9.6	92.1	426	209	8.15	7.02	2.23	0.13	0.11	37	5	330	130
11/15/2001	10.56	10.5	94.9	561	278	8.37	4.11	3.09	0.12	0.10	8	3	370	200
12/12/2001				585	283	8.16	3.82	3.23	0.2	0.12	10	2	33	<33
1/17/2002	11.21	7.6	93.8	600	290	8.42	2.86	3.68	0.17	0.11	23	2	110	70
2/6/2002	11.83	5.6	94	596	295	8.39	2.25	3.7	0.19	0.12	36	4	40	40
3/13/2002	10.56	8	89	589	288	8.25	2.16	3.40	0.12	0.11	19	5	60	60